

HISTORIC AMERICAN ENGINEERING RECORD

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KALAUPAPA WATER SUPPLY SYSTEM

HAER No. HI-42

(Waikolu Valley Water Supply System)

Waikolu Valley to Kalaupapa Settlement, Island of Molokai

Kalaupapa Vicinity

Island of Molokai

Maui County

Hawaii

Jet Lowe, photographer, assisted by Todd Croteau, April 1998.

These images were produced with the aid of members of the Sierra Club of Hawaii, who volunteered to clear overgrown structures and carry equipment into the valley. The collection of images is a representation of major features of the system; however, not all features are recorded. The Notley Dam structures, located at the remote springs (384', 393' and 480' above sea level) on the eastern slope of Waikolu Valley, were not photographed due to difficult terrain and time constraints. Several features remain intact and visible, but much of the dam itself has collapsed to the valley floor.

The following views are ordered from the head of the system down to the Kalaupapa Settlement. All altimeter readings are +/- 20' due to tidal changes in sea level.

HAER HI-42-1 INTAKE DAM NO. 1 AT HEAD OF SYSTEM (600' ALTITUDE), CONSTRUCTED WITH CONCRETE AND RUBBLE MASONRY IN 1948. INCLUDES INTAKE SCREEN AT LEFT AND SLUICE GATE AT RIGHT. TWO 8" CAST-IRON PIPES CARRY WATER FROM THE INTAKE TO THE OLD DAM (FORMER INTAKE) DOWN LINE.

HAER HI-42-2 FORMER INTAKE DAM NO. 2 AT 560', CONSTRUCTED OF RUBBLE MASONRY IN 1937-1938, VIEW LOOKING DOWN LINE. FORMER INTAKE GRILLE WAS TO LEFT SIDE OF DAM (TWO 8" IRON PIPES FROM NEW INTAKE NOW ENTER OLD INTAKE OPENING), BOX FLUME EXITS AT RIGHT AND CARRIES WATER TO AERATOR. NOTE THE SMALL SLUICEWAY OPENING AT CENTER ALONG WATERLINE. THIS DAM WAS SUPERCEDED BY THE NEW INTAKE DAM TO REACH THE MORE RELIABLE WATER SOURCE OF THE MAIN STREAM.

HAER HI-42-3 FORMER INTAKE DAM NO. 2, VIEW LOOKING UPSTREAM. AT LEFT IS RUBBLE MASONRY COVERING INTERSECTION OF THE TWO IRON PIPES FROM NEW DAM ENTERING OLD INTAKE OPENING. AT RIGHT IS BOX FLUME LEADING TO AERATOR.

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- HAER HI-42- 4 AERATOR AT 525', CONSTRUCTED 1937-1938, VIEWED FROM UPSTREAM (TRASH SCREEN REMOVED FOR CLARITY). WATER FROM INTAKE FLOWS THROUGH FLUME, THEN DAMS, AND SPILLS OVER STEPS TO MIX WITH OXYGEN, THUS REDUCING ACIDITY LEVELS. ACID INDUCES FASTER CORROSION OF PIPES AND SPOILS TASTE.
- HAER HI-42- 5 AERATOR VIEWED FROM DOWNSTREAM. FLUSH VALVE AT RIGHT OPENS TO CLEAR THE SYSTEM ABOVE OF SILT AND DEBRIS AND TO STOP THE FLOW OF WATER INTO THE SYSTEM DOWN LINE. BOX FLUME CONTINUES DOWN LINE TO SEDIMENTATION CHAMBER.
- HAER HI-42- 6 AERATOR VIEWED UPSTREAM. DETAIL OF FLUSH VALVE AND VIEW INTO BOX FLUME. NOTE WRENCH TO OPEN VALVE AND REMAINS OF OLD SHOVEL USED FOR MAINTENANCE. TRASH SCREEN MESH IS SEEN AT BOTTOM LEFT.
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- HAER HI-42- 8 SEDIMENTATION CHAMBER, VIEW UPSTREAM (PLANK COVER REMOVED FOR CLARITY). BOX FLUME DROPS SLIGHTLY INTO CHAMBER ON LEFT SIDE. CHAMBER IS A SERIES OF BAFFLES DESIGNED TO SLOW THE FLOW OF WATER. FLOW IS REDUCED TO ALLOW PARTICULATES TO SETTLE TO THE BOTTOM. TWO SCREENS (NOT SHOWN) FILTER LARGER DEBRIS.
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- HAER HI-42- 18 WAIKOLU STREAM CROSSING NO. 2, VIEW UPSTREAM. IRON PIPE RUNS WITHIN CONCRETE AND RUBBLE STRUCTURE AND CONTINUES BURIED UNTIL REACHING PIERS UNDER THE PALI.
- HAER HI-42- 19 PIPELINE INTERSECTION AT THE MOUTH OF WAIKOLU VALLEY ON THE BEACH. VALVE AT RIGHT (WITH WRENCH NEARBY) OPENS TO FLUSH VALLEY SYSTEM OUT. VALVE AT LEFT CLOSSES TO KEEP WATER FROM ENTERING SYSTEM ALONG THE PALI DURING REPAIRS.
- HAER HI-42- 20 8" PIPELINE ON BEACH AND ALONG PALI, VIEW WEST

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TOWARDS KALAWAO. NOTE GATE VALVE (LARGER) AND BLOW-OFF VALVE (SMALLER). PIPELINE GENERALLY AT 20' ABOVE SEA LEVEL.

- HAER HI-42- 21 VIEW EAST ALONG PALI TOWARDS WAIKOLU VALLEY OF ELEVATED PIPELINE ON CONCRETE PIERS. PIPE IS BURIED AT THIS POINT. NOTE REMAINS OF WOOD FRAMEWORK FOR CATWALK (DESTROYED).
- HAER HI-42- 22 VIEW EAST TOWARDS WAIKOLU VALLEY OF PIPELINE ALONG PALI. EYE BOLTS IN ROCK FACE AT RIGHT WERE USED BRIEFLY IN PLACE OF PIERS TO SUSPEND PIPE BY CHAIN BECAUSE THE CONCRETE PIERS WERE SUSCEPTIBLE TO HEAVY WAVE ACTION IN THIS AREA.
- HAER HI-42- 23 DETAIL OF PIPELINE PIERS, LOOKING EAST. FOREGROUND IS SLOPED TYPE, NEXT ONE IS PERPENDICULAR TYPE. A COMPRESSION COUPLING, USED TO REPAIR A BROKEN PIPE SECTION, CAN BE SEEN AT BOTTOM.
- HAER HI-42- 24 VIEW EAST TOWARD WAIKOLU VALLEY OF PIPELINE ALONG PALI.
- HAER HI-42- 25 VIEW OF PIPELINE AND COAST ALONG PALI LOOKING EAST.
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- HAER HI-42- 27 DETAIL OF DOUBLE PIER TYPE FOR PIPELINE ALONG PALI.
- HAER HI-42- 28 VIEW WEST TOWARD KALAWAO OF PIPELINE. PIPE IS COVERED WITH BOULDERS FOR PROTECTION. GATE VALVE AND BLOW-OFF VALVES ARE EXPOSED FOR ACCESS.
- HAER HI-42- 29 VIEW WEST TOWARDS KALAWAO OF PIPELINE, EXPOSED AT LOWER LEFT. "CAT" TRACKS, MADE BY THE CONSTRUCTION/MAINTENANCE VEHICLES, CAN BE SEEN ALONG BOULDER BEACH

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PIPE IS EXPOSED AT LEFT OF CONCRETE STRUCTURE.
- HAER HI-42- 31 ELEVATED PIPELINE CLIMBING TOWARDS KALAWAO. PIPE
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- HAER HI-42- 32 VIEW SOUTH INTO WAIALEIA VALLEY. PIPELINE CAN BE SEEN
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- HAER HI-42- 33 PIPELINE CROSSING DRY GULCH AT 140', NEAR FORMER U.S.
LEPROSY INVESTIGATION STATION SITE. PIPE CROSSING IS
SUPPORTED BY CONCRETE PYLONS AT EACH END.
- HAER HI-42- 34 VIEW WEST ALONG DAMIEN ROAD NEAR ST. PHILOMENA'S
CHURCH. PIPELINE IS BURIED ALONG LEFT SHOULDER OF
ROAD AND CONTINUES UP HILL TO RESERVOIR TANKS.
- HAER HI-42- 35 RESERVOIR TANKS ALONG DAMIEN ROAD NEAR KAUAHAKO
CRATER (282'). WOOD TANK AT LEFT WAS ERECTED CA. 1969.
CEMENT-LINED MASONRY TANKS WITH CORRUGATED METAL
ROOFS, CONSTRUCTED CA. 1894, ARE LOCATED AT RIGHT.
- HAER HI-42- 36 DETAIL OF TANKS, WITH COLLAPSED VALVE PIT FENCED OFF.
- HAER HI-42- 37 CEMENT-LINED RUBBLE MASONRY TANK, INTERIOR VIEW
SHOWING ROOF SYSTEM.
- HAER HI-42- 38 SAND FILTER AT LEFT AND CHLORINATOR AT RIGHT, DOWN
LINE FROM THE RESERVOIR, IMPROVED WATER QUALITY.
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LINES BRANCH INTO KALAUPAPA SETTLEMENT TO SUPPLY
RESIDENCES AND OTHER BUILDINGS.
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- HAER HI-42- 43 DETAIL OF OLD RESERVOIR AT KALAWAO.
- HAER HI-42- 44 INTERIOR DETAIL OF OLD RESERVOIR AT KALAWAO SHOWING
CEMENT-LINED RUBBLE CONSTRUCTION.
- HAER HI-42- 45 STEEL RESERVOIR TANKS FOR NEW SPRING-FED WATER
SYSTEM INSTALLED IN 1982. LOCATED IN WAIHANAU VALLEY,
THIS REPLACED THE WAIKOLU SYSTEM AND PROVIDES A MORE
CONSISTENT AND CLEAN WATER SUPPLY FOR KALAUPAPA.

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All color xeroxes were made from a duplicate color transparency.

Jet Lowe, photographer, assisted by Todd Croteau, April 1998.

- HAER HI-42- 46 (CT) INTAKE DAM NO. 2, VIEW LOOKING UPSTREAM. THIS
WAS FORMERLY THE MAIN INTAKE FOR THE SYSTEM.
- HAER HI-42- 47 (CT) AERATOR WITH FLUSH VALVE, VIEW UPSTREAM.

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Altimeter Readings for Kalaupapa Water Supply System

Please note that all readings are +/- 20 feet due to tidal variation in sea level. Measurements were taken in April 1998 by Todd Croteau and Jet Lowe.

Intake Dam (Dam No. 2)	600 ft.
Former Intake Dam (Dam No. 1)	560 ft.
Aerator	525 ft.
Sediment Chamber	520 ft.
Work House	490 ft.
Junction of iron/concrete pipes	460 ft.
Waikolu Stream Crossing No. 1	280 ft.
Waikolu Stream Crossing No. 2	80 ft.
Pipeline along beach	20 ft.
Waialea Stream Crossing	30 ft.
Pipe Crossing at dry gulch	140 ft.
Reservoirs, c. 1894	282 ft.
Sand Filter/Chlorinator House	275 ft.
Notley Dam System	
Spring No. 1	393 ft.
Spring No. 2	480 ft.
Spring No. 3	384 ft.